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INDEX II TO THE LITERATURE OF
AMERICAN ECONOMIC ENTOMOLOGY

INDEX II
TO THE
LITERATURE
OF
AMERICAN ECONOMIC
ENTOMOLOGY

January 1, 1915 to December 31, 1919

Compiled by
MABEL COLCORD

Edited by
E. PORTER FELT



AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS
MELROSE HIGHLANDS, MASS.
1921

INTRODUCTORY

The preparation of this Index was under the general charge of the special committee of the American Association of Economic Entomologists which started the movement resulting in the Banks' Index. This Index was possible only through the cooperation of Dr. L. O. Howard, Chief of the Bureau of Entomology, United States Department of Agriculture, who kindly detailed Miss Mabel Colcord to have charge of the preparation of the manuscript. To her, and her assistants, as well as to Dr. Howard, the economic entomologists of the world owe a debt of gratitude for the compilation of an immensely serviceable work.

The Index, when turned over to the Editorial Board of the Journal of Economic Entomology, comprised some 48,000 references besides numerous scientific names and other titles. It was necessary to reduce the size of the volume and if possible not seriously impair its value. The immense number of references made it impracticable to consult every citation and there are doubtless many errors of omission, both passive and active, for which the editor will probably be held responsible. There are a number of authors with the same surname. Initials were not included in the manuscript and the editor has not attempted to supply them. Their omission should not result in material confusion.

The following rules were adopted for guidance in this difficult undertaking, there being exceptions, mostly intentional.

The scope was limited to temperate and subtropical America, thus the extreme north and the Hawaiian Islands were excluded.

Only the better established or well known common names have been retained.

Anonymous articles in the agricultural press have been excluded, and all in farm papers in the case of a species or topic with numerous citations, such as *Aspidiotus perniciosus* and "Spraying." The omission of such citations is indicated by an asterik (*) following the name and in some cases citations of official press bulletins or circulars, the more ephemeral literature, have been omitted because data of value in these media are very likely to appear in bulletins or reports.

The nature of general works is so well indicated by the title that in order to avoid much duplication only a few of the more important subdivisions have been indexed in the following books dealing mostly with rather well known insects:

Essig, E. O., *Injurious and Beneficial Insects*, 2d Ed., 1915.

Herrick, G. W., *Insects of Economic Importance*, 1915.

O'Kane, W. C., *Injurious Insects*, 1916.

Osborn, Herbert, *Agricultural Entomology*, 1916.

Pierce, W. D., *Dangerous Insects Likely to be Introduced in the United States*, 1917.

Crosby, C. R., and Leonard, M. D., *Manual of Vegetable-Garden Insects*, 1918.

Washburn, F. L., *Injurious Insects and Useful Birds*, 1918.

Lochhead, Wm., *Class Book of Economic Entomology*, 1919.

There are many excellent contributions dealing with a number of species of the same genus and where possible there has been condensation and the abbreviation "spp." following a name may refer to a group of named species as well as to unknown forms.

E. P. FELT,
W. E. BRITTON,
W. E. HINDS,
W. C. O'KANE,
A. F. BURGESS,
Committee.

INDEX TO THE LITERATURE OF AMERICAN ECONOMIC ENTOMOLOGY

JANUARY 1, 1915 TO DECEMBER 31, 1919

By MABEL COLCORD

The following Index to the literature of American Economic Entomology for the five year period from January 1, 1915 to December 31, 1919 is a continuation of the Banks' Index, 1905 to 1914 inclusive, as that in turn was a modified extension of the Bibliography of American Economic Entomology published by the United States Department of Agriculture, parts I-V by Samuel Henshaw and parts VI-VIII by Nathan Banks.

The plan of the Banks' Index has been closely followed. The insects and other headings are arranged alphabetically; the references being by authors alphabetically, those by each author chronologically. Practically all anonymous articles have been omitted.

The references may be easily understood after reading the following explanation and referring, when necessary to the list of abbreviations.

"B." means bulletin, "C", circular, "R", report, "P. B.", press bulletin. Publications of experiment stations are referred to simply by State and number of bulletin, circular or report, as "Fla. B. 42" means Bulletin 42 of the Florida Agricultural Experiment Station. In New York, the Cornell bulletins are referred to as "N. Y. C. B."; the Geneva Station bulletins as "N. Y. Geneva B." The bulletins of the United States Department of Agriculture are referred to as "U. S. D. A. B.", the Yearbook articles as "U. S. Y. B."; the Farmers' Bulletins as "U. S. F. B."

"Pr." or "Proc." is used for Proceedings, "Jr." or "J." for Journal. The words "State" and "Annual" are usually omitted in the references, although in a few cases "St." (State) is retained because of possible confusion. The first figure after the "B." or "R." indicates the number of the volume (if a periodical) or of a bulletin or report and the next figure the page; if three or more numbers appear in the same reference the first is the volume, the second the number in the volume and the third the page in the number and a semicolon follows the volume number in all such cases. The year is usually added in all references as it is oftentimes a great help.

Questions of synonymy and nomenclature have been very kindly determined by the following members of the staff of the Bureau of Entomology:

Coleoptera, Mr. E. A. Schwarz and Mr. H. S. Barber.

Hymenoptera, Mr. R. A. Cushman, Mr. A. B. Gahan and Mr. S. A. Rohwer.

Diptera, Dr. J. M. Aldrich.

Orthoptera, Mr. A. N. Caudell.

Neuroptera, Mr. A. N. Caudell.

Odonata, Miss Bertha Currie.

Lepidoptera, Dr. H. G. Dyar and Mr. August Busck.

Hemiptera, Dr. A. C. Baker and Mr. E. H. Gibson.

Coccidae, Mr. E. R. Sasser and Mr. Harold Morrison.

Termitidae, Dr. T. E. Snyder.

Acarina, Dr. H. E. Ewing.

Parasites of animals, Mr. J. L. Webb.

Diseases of Bees, Dr. G. F. White.

Fungous diseases of insects, Dr. A. T. Speare.

Many helpful suggestions have come also from Mr. R. P. Currie, Mr. C. H. Popenoe, Mr. Jacob Kotinsky and Mr. Nathan Banks.

The preparation of the Index has been greatly facilitated also by the untiring efforts of three clerks of the Bureau, Miss M. G. Champney, Miss Florence Gildersleeve and Mrs. Wyatt L. Ashcraft. Miss Virginia Revere and Mr. G. E. Moore gave great assistance in copying the manuscript.

LIST OF ABBREVIATIONS

The list of abbreviations given below is supplementary to the preceding explanations:

Adv. = Advancement	Elev. = Elevator
Advoc. = Advocate	Eng. = Engineering
Agr. = Agriculture, Agriculturist, Agricultural	Ent. = Entomologist, Entomology
Am. or Amer. = American	Exch. = Exchange
Ann. = Annals, Annual	Exp. = Experimental
App. = Appendix	Exterm. = Extermination
Archiv. = Archives	Farm. = Farmer
Assoc. = Association	Fed. = Federal
B. = Bulletin	Fert. = Fertilizer
B. C. = British Columbia	Flor. = Florist
Bank. = Banker	For. = Forestry
Bd. = Board	Fr. = Fruit
Bien. = Biennial	Fumig. = Fumigation
Biol. = Biological	Fung. = Fungicide
Bost. = Boston	Gard. = Gardeners, Gardening
Br. = Branch	Gaz. = Gazette
Bur. = Bureau	Gen. = General
Bul. = Bulletin	Gentl. = Gentleman
C. = Circular	Geog. = Geographic
C. when after N. Y. = Cornell	Geol. = Geology
C. Gentl. = Country Gentleman	Gr. = Grain
Can. = Canada	Grow. = Grower
Clem. = Clemson	Homest. = Homestead
Col. = Colmans	Hort. = Horticulture, Horticulturist
Coll. = College	Hosp. = Hospital
Comm. = Commission	Hyg. = Hygiene, Hygienic
Comp. = Comparative	Illus. = Illustrated
Confer. = Conference	Impl. = Implement
Cong. = Congress.	Indus. = Industrialist
Conserv. = Conservation	Intec. = Infectious
Contr. = Contribution	Infor. = Information
Conv. = Convention.	Inj. = Injurious
Coop. = Cooperative	Ins. = Insect
Cranb. = Cranberry	Insect. = Insecticide
Cult. = Cultivator	Insp. = Inspection
Cut. = Cutaneous	Internat. = International
D. A. = Department Agriculture	Interst. = Interstate
Dairym. = Dairyman	J., Jr. or Jour. = Journal
Dept. = Department	L. I. = Long Island
Dermat. = Dermatology	Lab. = Laboratory
Destr. = Destructive	Lumberm. = Lumberman
Dis. = Diseases	Mag. = Magazine
Dom. = Dominion	Man. = Manual
Ec. = Economic	Med. = Medicine, Medical
Ecol. = Ecology	Meet. = Meeting
Educ. = Education	Mem. = Memoir
	Met. = Metallurgical

INDEX OF LITERATURE, 1915-1919

Mil. = Military	Sci. = Science
Mill. = Miller	Sec. = Secretary
Mod. = Modern	Serv. = Service
Month. = Monthly	Sess. = Session
Mos. = Mosquito	Soc. = Society
Mus. = Museum	So. = South
N. Eng. = New England	South. = Southern
Nat. = National, Naturalist	Sp. = Special
Northw. = Northwestern	St. = State
Not. = Notices	St. N. = Saint Nicholas
Nurs. = Nursery	Sta. = Station
Off. = Office	Statis. = Statistical
Ont. = Ontario	Stockm. = Stockman
Or. = Orange	Succ. = Successful
Orch. = Orchard	Sup. = Supplement
Ott. = Ottawa	Suppr. = Suppression
P. B. = Press Bulletin	Supt. = Superintendent
Pac. = Pacific	Surg. = Surgical
Path. = Pathological	Surv. = Survey
Pl. = Plant, Planter	S. W. = Southwestern
Poly. = Polytechnic	Syn. = Synopsis
Pom. = Pomological	Tech. = Technical
Pop. = Popular	Tr. or Trans. = Transactions
Poult. = Poultry	Trop. = Tropical
Prai. = Prairie	Univ. = University
Prevent. = Preventive	U. S. B. = Bulletin U. S. Bureau of Entomology
Proclam. = Proclamation	U. S. D. A. B. = Bulletin U. S. Dept. Agriculture
Prod. = Producer	U. S. F. B. = U. S. Dept. Agr. Farmers' Bulletin
Prog. = Progressive	U. S. Y. B. = Yearbook U. S. Dept. Agriculture
Protec. = Protection	Veg. = Vegetation
Pub. = Public, Publication	Vet. = Veterinary
Quar. = Quarterly	West. = Western
R. = Report	Wkly. = Weekly
Rec. = Record	Zool. = Zoology
Res. = Research	
Rev. = Review	
Roy. = Royal	
Rur. = Rural	
Ry. = Railway	

AMERICAN ECONOMIC ENTOMOLOGY INDEX OF LITERATURE, 1915-1919

BY MABEL COLCORD

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- Box leaf midge**, *see* *Monarthropalpus buxi*
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Fernald, Mass. R. 29, 79a, 1917.
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Melander, Wash. Hort. Soc. Proc. 13, 121, 1917.
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Slawson, Florists' Exc. 45, 116, 1918.
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Treherne, Agr. Jour. B. C. 1, 168, 1916.
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Morris, Ont. Ent. Soc. R. 46, 19, 1916.
Weiss & Nicolay, Can. Ent. 51, 86, 1919.
- Brachys ovata**
Morris, Ont. Ent. Soc. R. 46, 19, 1916.
Weiss & Nicolay, Can. Ent. 51, 86, 1919.
- Brachystola magna**
Merrill, N. Mex. B. 102, 9, 1916.
Pierce, U. S. F. B. 890, 10, 1917.
Walton, U. S. F. B. 747, 1, 1916.
- Brachystola sp.**
Milliken, Kans. B. 215, 21, 1916.
- Bracon brevicornis**, *see* *Habrobracon brevicornis*
- Bracon mellitor**, *see* *Microbracon mellitor*
- Bracon nigropictus**, *see* *Macrodyctium nigropictus*
- Bracon pectinator**
Felt, N. Y. R. 29, 29, 1915.
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Gossard and King, Ohio B. 329, 70, 1918.
Holloway & Loftin, U. S. D. A. B. 746, 41, 1919.
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- Bradycinetus fossator**
Knaus, Brooklyn Ent. Soc. B. 10, 37, 1915.
- Bramble flea louse**, *see* *Trioza tripunctata*

Bran and arsenite bait

Flint, J. Ec. Ent. 11, 187, 1918.

Bran mash poison

Dean, J. Ec. Ent. 8, 219, 1915.

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Dunn, J. Ec. Ent. 10, 474, 1917.

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Watson, Fla. Bug. 1, 70, 1918.

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Timberlake, Proc. U. S. Nat. Mus. 56, 193, 1919.

Brethesia latifrons

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Cardiff, Wash. B. 127, 32, 1915.

Cardiff, Wash. B. 136, 41, 1917.

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Cotton, Rev. Agr. Puerto Rico 1, 159, 1918.

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Huard, Dept. Agr. Prov. Quebec, B. 23, 26, 1916.

Lewis, Chase & Turner, Ga. Bd. Ent. B. 53, 21, 1919.

McIndoo, J. Agr. Res. 7, 103, 1916.

Parrott & Fulton, N. Y. Geneva C. 30, 1914.

Reed, Ga. Bd. Ent. B. 41, 14, 1915.

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Strickland, Proc. Ent. Soc. B. C. 9, 84, 1916.

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Watson, Fla. B. 151, 144, 1919.

Bristletail, *see* *Lepisma domestica*

Bristly rose-worm, *see* *Cladius pectinicornis*

Broad-bean weevil, *see* *Bruchus rufimanus*

Brochymena annulata

Watson, J. Ec. Ent. 9, 527, 1916.

Brochymena quadripustulata

Somes, Mo. Fruit B. 24, 9, 1914.

Brontes dubius

Clemens, N. Y. C. B. 383, 297, 1916.

Bronze apple-tree weevil, *see* *Magdalis aeneascens*

Bronze birch borer, *see* *Agrilus anxius*

Bronze cutworm, *see* *Nephelodes emmedonia*, *Nephelodes minians*, *Nephelodes violans*

Brown apricot scale, *see* *Lecanium corni*

Brown salt marsh mosquito, *see* *Aedes cantator*

Brown spider beetle, *see* *Ptinus brunneus*

Brown-tail moth, *see* *Euproctis chrysorrhoea*

Brown tick, *see* *Rhipicephalus appendiculatus*

Bruchophagus funebris

Cooley, Mont. B. 112, 61, 1916.

Crosby & Leonard, N. Y. Dept. Agr. B. 87, 2870, 1916.

Crosby & Leonard, N. Y. C. Ext. B. 20, 17, 1917.

Bruchophagus funebris (*Cont'd.*)

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 Dean, Kans. Indust. 41, 23, 4, 1915.
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 Dean, Iowa Ext. B. 5, 34, 1916.
 Dean, Kans. St. Bd. Agr. R. 35, 398, 1916.
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 Haseman, Mo. B. 134; 28, 35, 1915.
 Lochhead, Ont. Ent. Soc. R. 45, 60, 1915.
 Lovett, Oreg. Bien. Crop Pest R. 2, 158, 1915.
 Melander, Am. Elevator & Gr. Trade, 33, 748, 1915.
 Melander, Mo. & Kans. Farm. 31, 7, 19, 1915.
 Morrill, Ariz. B. 26, 564, 1915.
 Morrill, Ariz. Hort. Com. R. 8, 27, 1916.
 Morrill, Ariz. R. 27, 294, 1916.
 Morrill, Southw. Stock-Farm. 32, 154, 1916.
 Morrill, Ariz. Comm. Agr. & Hort. R. 9, 43, 1917.
 Moznette, Oreg. Ext. B. 203, 2, 1917.
 Pieters, N. Y. Dept. Agr. B. 87, 683, 1916.
 Smith, Gem St. Rur. & Ida. Farm. 24, 36, 21, 1919.
 Treherne, Agr. Jour. B. C. 3, 281, 1919.
 Urbahns, J. Agr. Res. 7, 147, 1916.
 Urbahns, J. Agr. Res. 8, 277, 1917.
 Washburn, Minn. R. 22, 33, 1915.
 Washburn, Minn. R. 23, 43, 1916.
 Williamson, Minn. Ent. R. 17, 95, 1918.
- Bruchus chinensis**
 Back & Duckett, U. S. F. B. 983, 12, 14, 1918.
 Garman, Ky. B. 213, 318, 1917.
 Gilbert & Popenoe, U. S. D. A. C. 35, 20, 1919.
 Headlee, N. J. C. 91, 4, 1917.
 Metcalf, N. C. R. 38, 23, 1915.
 Metcalf, J. Ec. Ent. 10, 74, 1917.
 Orton & Chittenden, U. S. F. B. 856, 53, 1917.
 Sanborn, Okla. Ext. C. 41, 41, 1916.
 Watson, Fla. B. 134, 85, 1917.
 Watson, Fla. B. 151, 163, 1919.
- Bruchus fabae**, *see* **Acanthoscelides obtectus**
- Bruchus hibisci**
 Weiss, N. J. Dept. Agr. Bur. Stat. C. 25, 5, 1919.
 Weiss & Dickerson, J. N. Y. Ent. Soc. 27, 49, 1919.
- Bruchus lentis**
 Back & Duckett, U. S. F. B. 983, 15, 1918.
- Bruchus limbatus**
 Amundson, Cal. Hort. B. 5, 33, 1916.
- Bruchus obtectus**, *see* **Acanthoscelides obtectus**
- Bruchus pisorum***
 Back & Duckett, U. S. F. B. 983, 11, 1918.
 Bethune, Ont. Dept. Agr. B. 251, 25, 1917.
 Britton, Conn. B. 195, 5, 1917.
 Britton, Conn. B. 203, 332, 1917.
 Campbell, J. Ec. Ent. 12, 285, 1919.
 Edmundson, Ida. B. 87, 26, 1916.
 Edmundson & Welch, Ida. B. 106, 27, 1918.
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Cotton square daubers, see Lygus elisus and Lygus pratensis

Cotton stainer, see Dysdercus suturellus

Cottonwood borer, see Plectrodera scalator

Cottonwood leaf beetle, see Melasoma scripta

Cotton worm, see Alabama argillacea

Cottony cushion scale, see Icerya purchasi

Cottony scale, see Pulvinaria vitis

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 Taylor, Utah Hort. Com. Bien. R. 1915-16, 34, 1917.
 Treherne, Cal. Hort. B. 7, 579, 1918.
 Vosler, Cal. Hort. B. 5, 188, 1916.
 Wallace, Ind. Ent. R. 9, 12, 1917.
 Washburn, Minn. R. 22, 32, 1915.
 Washburn, Minn. R. 23, 42, 1916.
 Washburn, Minn. R. 24, 47, 1917.
 Washburn, Minn. R. 25, 54, 1918.
 Wheeler, Mass. St. Bd. Agr. R. 65, 37, 1917.
 ——— Miss. St. Plant Bd. C. 2, 1919.

Inspection house, government

- Sasscer, J. Ec. Ent. 9, 219, 1916.

Inspection imported stock

- Britton, Conn. B. 203, 240, 1917.
 Britton, Conn. B. 211, 259, 1919.
 Bruner, Neb. Ent. B. 4, 7, 1915.
 Bruner, Neb. Ent. B. 5, 6, 1917.
 Conant, Me. Dept. Agr. R. 14, 100, 1915.
 Dean, Kans. Ent. Com. Bien. R. 5; 6, 8, 1916.
 Dean, Kans. Hort. Soc. Tr. 33; 26, 185, 1916.
 Dean, Kans. Hort. Soc. Tr. 34; 192, 201, 1918.
 Forbes, Ill. Hort. Soc. Tr. n. s. 49, 65, 1915.
 Forbes, Ill. Hort. Soc. Tr. n. s. 50, 60, 1916.
 Garman, Ky. Agr. Labor & Stat. Bien. R. 21, 79, 1916.
 Garman, Ky. Agr. Labor & Stat. Bien. R. 22, 412, 1917.
 Headlee, N. J. St. Bd. Agr. R. 42, 175, 1915.
 Hunter, Kans. Hort. Soc. Tr. 33; 38, 179, 1916.
 Marlatt, U. S. D. A. Ann. R. 1916, 376, 1917.
 Marlatt, U. S. D. A. Ann. R. 1917, 423, 1918.
 Marlatt, U. S. D. A. Ann. R. 1918, 440, 1919.
 Morrill, Ariz. Comm. Agr. & Hort. R. 7, 11, 1915.

- Morrill, Ariz. Comm. Agr. & Hort. R. 8, 15, 1916.
 Morrill, Ariz. Comm. Agr. & Hort. R. 9, 19, 1917.
 Price, Va. Ent. & P. P. R. 10, 13, 1916.
 Sanders & Fracker, Wis. Dept. Agr. B. 10, 32, 1916.
 Sasscer, J. Wash. Acad. Sci. 7, 26, 1917.
 Schoene, Va. Ent. & P. P. R. 10, 6, 1916.
 Schoene, Va. Ent. & P. P. R. 11, 14, 1918.
 Severin, So. Dak. Ent. R. 10, 10, 1919.
 Sherman, N. C. R. 38, 20, 1915.
 Surface, Penn. Dept. Agr. Zool. P. B. 309, 1915.
 Washburn, Minn. Ent. C. 37, 4, 1916.
 Worsham, Ga. Bd. Ent. B. 42, 26, 1915.
 Worsham, Ga. Bd. Ent. B. 45, 26, 1915.
 Worsham, Ga. Bd. Ent. B. 48, 35, 1917.
 Worsham, Ga. Bd. Ent. B. 51, 43, 1918.
 ——— U. S. Fed. Hort. Bd. S. R. A. 20, 1915; 32, 103, 1916; 59, 4, 1919.

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- Ayers, Tex. Dept. Agr. B. n. s. 19, 3, 1915.
 Bentley, Tenn. Bd. Ent. B. 21, 1917.
 Cotton, Ohio Dept. Agr. Off. B. 10, 2, 9, 1918.
 Haseman, J. Ec. Ent. 11, 120, 1918.
 Headlee, Cook & Weiss, N. J. Dept. Agr. B. 22, 98, 1919.
 Sanders, J. Ec. Ent. 9, 206, 1916.
 Sanders, Wis. Dept. Agr. C. 1, 1915.
 Washburn, Minn. Ent. C. 37, 1916.
 ——— Colo. Ent. C. 22, 1917.
 ——— Fla. St. Pl. Bd. C. 7, 1915.
 ——— Fla. St. Pl. Bd. C. 8, 1915.
 ——— Kans. Ent. Com. C. 4, 1915.
 ——— Ill. Dept. Agr. Pl. Indus. C. 1, 1917.
 ——— Minn. Ins. Life. 4, 4, 4, 1917.
 ——— Miss. B. 12, 4, 10, 1915.
 ——— S. D. Hort. Soc. R. 14, 198, 1917.
 ——— S. D. Ent. C. 1, 1918.

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- Washburn, Minn. Ins. Life, 4, 3, 5, 1917.

Inspection, nursery

- Atwood, N. Y. Dept. Farms & Markets, Div. Agr. C. 120, 1915; C. 140, 1916; C. 160, 1917; C. 172, 1918.
 Ayers, Tex. Com. Agr. R. 10, 80, 1917.
 Ball, Wis. Dept. Agr. C. 5, 1916.

Ball & Fracker, Wis. Dept. Agr. B. 23, 60, 1919.
 Britton, Conn. B. 211, 255, 1919.
 Bruner, Neb. Ent. B. 4, 1915.
 Bruner, Neb. Ent. B. 5, 3, 1917.
 Conant, Me. Dept. Agr. R. 14, 96, 1916.
 Dean, Kans. Ent. Com. Bien. R. 5; 5, 7, 1916.
 Dean, Kans. Hort. Soc. Tr. 33; 26, 185, 1916.
 Dean, Kans. Hort. Soc. Tr. 34; 192, 201, 1918.
 Dean, Kans. Ent. Com. Bien. R. 6; 5, 9, 1919.
 Forbes, Ill. Hort. Soc. Tr. n. s. 49, 59, 1915.
 Forbes, Ill. Hort. Soc. Tr. n. s. 50, 54, 1916.
 Garman, Ky. R. 30, 43, 1917.
 Garman, Ky. Agr. Labor & Stat. Bien. R. 22; 409, 419, 1918.
 Gillette & List, Colo. Ent. C. 26; 4, 16, 1917.
 Haseman, Sullivan & Hollinger, Mo. B. 147, 62, 1917.
 Hunter, Kans. Ent. Com. Bien. R. 5, 1916.
 Hunter, Kans. Hort. Soc. Tr. 33, 37, 1916.
 Hunter, Kans. Ent. Com. Bien. R. 6; 12, 18, 1919.
 Leopold, Quebec Soc. Protec. Pl. R. 7, 38, 1915.
 Morris, La. R. 28, 24, 1916.
 Newell, Fla. St. Pl. Bd. Quar. B. 1, 81, 1917.
 O'Byrne, Fla. Hort. Soc. Proc. 28, 137, 1915.
 O'Kane, N. H. Dept. Agr. Bien. R. 1918, 201, 1919.
 Osborn, Ohio J. Sci. 15, 458, 1915.
 Sanders & Fracker, Wis. Dept. Agr. B. 10, 31, 1916.
 Severin, So. Dak. Ent. C. 1, 1918.
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 Sherman, N. C. R. 38, 21, 1915.
 Sherman, N. C. Dept. Agr. Bien. R. 1918, 76.
 Smith, Cal. Hort. B. 8, 50, 1919.
 Symons, Md. Ext. R. 4, 71, 1919.
 Washburn, Minn. Hort. Soc. Trans. 43, 399, 1915.

Washburn, Minn. Ent. C. 37, 1916.
 Wilkins, Me. Dept. Agr. R. 15, 70, 1916.
 Worsham, Ga. Bd. Ent. B. 42, 20, 1915.
 Worsham, Ga. Bd. Ent. B. 45, 20, 1915.
 Worsham, Ga. Bd. Ent. B. 48, 29, 1917.
 Worsham, Ga. Bd. Ent. B. 51, 38, 1918.
 ——— Ala. St. Bd. Hort. Rules & Reg. 1918.
 ——— Fla. Grower, 20, 7, 8, 1919.
 ——— Mass. St. Bd. Agr. Nur. Inspec. R. 13, 1915.
 ——— Minn. Nur. & Or. Insp. News Letter 1, 1915; Letter 2, 1915; Letter 3, 1915; Letter 6, 1916.
 ——— Miss. B. 12, 4, 10, 1915.
 ——— Mo. P. B. 132, 1915.
 ——— N. C. Dept. Agr. Ent. C. 22, ed. 2, 1916.

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Allen, Oreg. Hort. Soc. R. 8, 91, 1917.
 Hunter, Kans. Hort. Soc. Tr. 33, 179, 1916.
 Sanders & Fracker, Wis. Dept. Agr. B. 10, 36, 1916.
 Sherman, N. C. R. 38, 20, 1915.
 Symons, Md. Agr. Soc. R. 1, 176, 1917.
 Washburn, Minn. Hort. Soc. Trans. 43, 399, 1915.
 ——— Ark. St. Pl. Bd. C. 3, 1917.
 ——— Mont. Hort. Bd. Bien. R. 9, 14, 1917.

Inspection, parcel post

Newell, Fla. St. Pl. Bd. Quar. B. 3, 61, 1919.

Inspection, potato

Gillette & List, Colo. Ent. C. 26, 13, 1917.

Inspection, railway

Newell, Fla. St. Pl. Bd. Quar. B. 3, 52, 1919.

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Iphiaulax medianus

Holloway & Loftin, U. S. D. A. B. 746, 41, 1919.
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Iphiaulax sp.

Holloway & Loftin, U. S. D. A. B. 746, 41, 1919.

- Ipochnus fasciatus**
Vosler, Cal. Hort. B. 4, 400, 1915.
- Ips balsameus**
Swaine, Agr. Gaz. Can. 6, 230, 1919.
- Ips caelatus**
Clemens, N. Y. C. B. 383, 297, 1916.
- Ips calligraphus**
Clemens, N. Y. C. B. 383, 297, 1916.
- Ips concinnus**
Chamberlin, Oreg. B. 147, 15, 1918.
Compere, Cal. Hort. B. 4, 574, 1915.
Hopkins, Proc. Ent. Soc. Wash. 17, 54, 1915.
- Ips confusus**
Hopping, Proc. Soc. Amer. For. 10, 183, 1915.
- Ips fasciatus**
Gibson, Ont. Ent. Soc. R. 47, 16, 1917.
Vinal & Caffrey, Mass. B. 189, 59, 1919.
Washburn, Minn. Hort. Soc. Trans. 43, 398, 1915.
- Ips longidens**
Blackman, Psyche, 26, 85, 1919.
Clemens, N. Y. C. B. 383, 297, 1916.
- Ips mexicanus**
Hopkins, Proc. Ent. Soc. Wash. 17, 54, 1915.
- Ips pini**
Blackman, Psyche 26, 89, 1919.
Clemens, N. Y. C. B. 383; 287, 297, 1916.
- Ips plastographus**
Herbert, J. Ec. Ent. 12, 337, 1919.
- Ips radiatae**
Herbert, J. Ec. Ent. 12, 337, 1919.
Hopkins, Proc. Ent. Soc. Wash. 17, 54, 1915.
- Ips spp.**
Pearson, J. of Forest. 16, 282, 1918.
- Iridomyrmex analis**
Smith, Ent. News 29, 24, 1918.
- Iridomyrmex humilis**
Barber, U. S. D. A. B. 377, 1916.
DeOng, J. Ec. Ent. 9, 468, 1916.
Essig, Cal. Hort. B. 5, 119, 1916.
Headlee, N. J. R. 1914, 353.
Hecke, Cal. Hort. B. 6, 245, 1917.
Hinds, Ala. Poly. R. 28, 26, 1916.
Hinds, Ala. Poly. R. 30, 22, 1918.
Holloway & Loftin, U. S. D. A. B. 746, 39, 1919.
Horton, U. S. D. A. B. 647, 1918.
- Horton, U. S. F. B. 928, 1918.
Jones, U. S. D. A. B. 703, 2, 1918.
Marlatt, U. S. F. B. 740, 6, 1916.
Morse, Facts about Sugar 9, 410, 1919.
Pellett, Amer. Bee J. 59, 260, 1919.
Smith, Cal. Hort. B. 6, 254, 1917.
Smith, Ent. News 29, 24, 1918.
Smith, J. Ec. Ent. 12, 465, 1919.
Thomas, Ala. Poly. C. 39, 55, 1918.
Woglum and Neuls, U. S. F. B. 862, 11, 1917.
Worsham, Ga. Bd. Ent. B. 45, 17, 1915.
Zuber, Tex. Comm. Agr. R. 11, 50, 1919.
- Iridomyrmex pruinosus**
McCulloch and Hayes, J. Ec. Ent. 9, 31, 1916.
- Iridomyrmex sp.**
Sasscer, J. Ec. Ent. 11, 128, 1918.
- Iron arsenite**
High, U. S. D. A. B. 160, 18, 1915.
- Iron-sulphide**
Melander & Heald, Wash. Pop. B. 100, 11, 1916.
Park, Oreg. Bd. Hort. Bien. R. 14, 45, 1917.
Volek, Cal. Cult. 48, 347, 1917.
- Isadelphus extensor**
Cushman, Proc. U. S. Nat. Mus. 55, 527, 1919.
- Ischnaspis longirostris**
Felt, N. Y. R. 32, 77, 1918.
Wilson, Fla. St. Pl. Quar. B. 2, 9, 1917.
- Ischnodemus fallicus**
Somes, J. Ec. Ent. 9, 44, 1916.
- Iseropus alboricta**
Webster, Iowa B. 179, 256, 1918.
- Iseropus coelebs**
Britton, Conn. R. 16, 109, 1917.
Cushman, Proc. Ent. Soc. Wash. 20, 11, 1918.
Howard, U. S. F. B. 701, 7, 1916.
Payne, Proc. Ent. Soc. Nova Scotia 3, 67, 1918.
Quaintance, U. S. F. B. 662, 7, 1915.
Snodgrass, Ind. Ent. R. 9, 188, 1917.
- Isodromus iceryae**
Clausen, Cal. B. 258, 39, 1915.
McGregor & McDorrough, U. S. D. A. B. 416, 47, 1917.

- Timberlake, Proc. U. S. Nat. Mus. 56, 181, 1919.
- Isodromus spp., key**
Timberlake, Proc. U. S. Nat. Mus. 56, 178, 1919.
- Isometrus maculatus**
Herns, Med. & Vet. Ent. 371, 1915.
- Isosoma grandis**
Doane, Cal. Hort. B. 5, 69, 1916.
Doane, J. Ec. Ent. 9, 398, 1916.
Haseman, Mo. B. 134, 20, 1915.
Henderson, Utah Crop Pest Com. B. 2, 25, 1918.
Larrimer & Ford, J. Ec. Ent. 12, 417, 1919.
Phillips, J. Ec. Ent. 10, 141, 1917.
Phillips & Emery, Proc. U. S. Nat. Mus. 55, 440, 1919.
Riley and Johannsen, Med. Ent. 69, 1915.
- Isosoma orchidearum**
Felt, N. Y. R. 30, 89, 1915.
Headlee, N. J. R. 1916, 506.
Moore, N. J. B. 308, 1916.
Weiss, Can. Ent. 48, 142, 1916.
Weiss, N. J. B. 296, 18, 1916.
- Isosoma sp.**
Crosby & Leonard, N. Y. C. Ext. B. 20, 11, 1917.
Crosby & Leonard, N. Y. Dept. Agr. B. 87, 576, 1918.
McConnell, J. Ec. Ent. 11, 169, 1918.
Phillips & Emery, U. S. Nat. Mus. Proc. 55, 433, 1919.
- Isosoma tritici**
Allison, Purdue Agr. 13, 430, 1919.
Bentley, Tenn. Dept. Agr. Bien. R. 1917-19, 62.
Cotton, Ohio Dept. Agr. Off. B. 11, 7, 5, 1919.
Doane, J. Ec. Ent. 9, 399, 1916.
Garman, Ky. Ent. & Bot. C. 4, 9, 1916.
Gossard, J. Ec. Ent. 12, 50, 1919.
Gossard and Parks, J. Ec. Ent. 12, 63, 1919.
Henderson, Utah Crop Pest Com. B. 2, 25, 1918.
Lochhead, Quebec Soc. Protec. Pl. R. 8, 105, 1916.
Parks, Agr. Student 25, 22, 1918.
Parks, Ohio Farm. 144, 295, 1919.
Pettit, Mich. Ext. B. 16, 1918.
- Phillips, J. Ec. Ent. 10, 140, 1917.
Phillips, U. S. F. B. 1005, 1918.
Phillips & Emery, Proc. U. S. Nat. Mus. 55, 451, 1919.
Talbert, Mo. St. Bd. Agr. R. 49, 294, 1917.
Woodbury, Ind. R. 32, 34, 1919.
- Isosoma tritici, parasitism**
Gossard & Parks, J. Ec. Ent. 12, 63, 1919.
- Isosoma vaginicum**
Doane, J. Ec. Ent. 9, 398, 1916.
Gossard, J. Ec. Ent. 12, 60, 1919.
Pettit, Mich. Ext. B. 16, 1918.
Phillips & Emery, Proc. U. S. Nat. Mus. 55, 455, 1919.
- Isotoma minuta**
Felt, N. Y. R. 33, 62, 1918.
- Itame ribearia, see Cymatophora ribearia**
- Itch mite of cattle, see Psoroptes communis**
- Itch mite of man, see Sarcptes scabiei**
- Ithycerus noveboracensis**
Sharp, J. N. Y. Ent. Soc. 26, 215, 1918.
Somes, Mo. Fruit B. 24, 8, 1914.
- Itonida catalpae**
Cory, Md. Agr. Soc. R. 1, 207, 1917.
Houser, Ohio B. 332, 312, 1918.
- Itonida tritici, see Thecodiplosis mosellana**
- Itoplectis annulipes, see Pimplidea aequalis**
- Itoplectis behrensi**
Burke, Proc. Ent. Soc. Wash. 21, 125, 1919.
- Itoplectis behrensi, parasite**
Cushman, Proc. U. S. Nat. Mus. 55, 524, 1919.
- Itoplectis conquisitor**
Baird, Agr. Gaz. Can. 5, 770, 1918.
Britton, Conn. R. 16, 109, 1917.
DuPorte, Quebec Soc. Protec. Pl. R. 7, 76, 1915.
DuPorte, Quebec Soc. Protec. Pl. R. 9, 133, 1917.
Hawley, N. Y. C. Mem. 15, 218, 1918.
Herrick & Leiby, N. Y. C. B. 367, 260, 1915.
Howard, U. S. F. B. 701, 7, 1916.
Quaintance, U. S. F. B. 662, 7, 1915.
Stearns, J. Ec. Ent. 12, 348, 1919.
Wildermuth & Caffrey, U. S. D. A. B. 443, 10, 1916.

- Itopectis marginatus***, *see* **Pimplidea tenuicornis**
- Itopectis obesus***
Cushman, Proc. U. S. Nat. Mus. 53, 467, 1917.
- Itopectis rufuscula***, *see* **Pimplidea aequalis**
- Illys ceresarum***
Brittain, Proc. Ent. Soc. Nova Scotia 2, 39, 1915.
- Itycorgia discolor***
Washburn, Minn. Ent. R. 17, 155, 1918.
- Itycorgia sp.***
Britton, Conn. B. 203, 360, 1917.
- Ixodes bicornis***
Riley and Johannsen, Med. Ent. 260, 1915.
- Ixodes californicus***
Hermes, Med. & Vet. Ent. 301, 1915.
- Ixodes cookei***
Riley and Johannsen, Med. Ent. 66, 260, 1915.
- Ixodes hexagonus***
Fantham, Anim. Par. 500, 1916.
Riley and Johannsen, Med. Ent. 225, 260, 1915.
- Ixodes holocyclus***
Chandler, Anim. Par. 359, 1918.
Fantham, Anim. Par. 499, 1916.
- Ixodes kingi***
Jackson, Farm. Adv. 53, 806, 1918.
- Ixodes pilosus***
Chandler, Anim. Par. 359, 1918.
- Ixodes reduvius***, *see* ***Ixodes ricinus***
- Ixodes ricinus***
Chandler, Anim. Par. 167, 1918.
Fantham, Anim. Par. 497, 704, 1916.
Fitch, J. Am. Vet. Med. Assoc. 53, 316, 1918.
Hermes, Med. & Vet. Ent. 301, 321, 365, 1915.
Reakes, J. Am. Vet. Med. Assoc. 54, 759, 1919.
Riley and Johannsen, Med. Ent. 66, 225, 260, 1915.
- Ixodes scapularis***
Riley and Johannsen, Med. Ent. 66, 260, 1915.
- Jadera haematoloma***
Pierce, U. S. F. B. 890, 21, 1917.
- Jalysus spinosus***
Somes, Mo. Fruit B. 24; 5, 16, 1914.
- Somes, Mo. Fruit Bien. R. 1913-14, 10.
Somes, J. Ec. Ent. 9, 39, 1916.
- Janetiella coloradensis***
Felt, Brooklyn Ent. Soc. B. 10, 75, 1915.
- Janetiella siskiyou***
Felt, J. N. Y. Ent. Soc. 25, 194, 1917.
- Janthinosoma***, *see* ***Psorophora***
- Janus abbreviatus***
Middleton, Proc. Ent. Soc. Wash. 19, 177, 1917.
Walden, Conn. B. 203, 359, 1917.
Washburn, Minn. Ent. R. 17, 155, 1918.
Weiss, J. Ec. Ent. 10, 224, 1917.
- Janus integer***
Caesar, Ont. Ent. Soc. R. 45, 45, 1915.
Middleton, Proc. Ent. Soc. Wash. 19, 178, 1917.
Washburn, Minn. Ent. R. 17, 155, 1918.
Weiss, N. J. Dept. Agr. C. 26, 20, 1919.
- Japanese beetle***, *see* ***Popillia japonica***
- Jassus spp.***
Osborn, Me. B. 238, 108-149, 1915.
- Jiggers***, *see* ***Trombidium sp.***
- Joint worm***, *see* ***Isosoma tritici***
- Jonthonota nigripes***
Barber, Proc. Ent. Soc. Wash. 18, 121, 1916.
- Julus caeruleocinctus***
Hartzell, N. Y. Geneva B. 442, 714, 1917.
Hawley, N. Y. C. Mem. 15, 216, 1918.
- Julus spp.***
Riley and Johannsen, Med. Ent. 132, 1915.
- June beetle***, *see* ***Phyllophaga sp.***
- Juniper berry insects***
Marcovitch, Ann. Ent. Soc. Amer. 8, 163, 1915.
- Juniper scale***, *see* ***Diaspis carueli***
- Juniper web-worm***, *see* ***Ypsolophus marginellus***
- Kakivoria flavofasciata***
Tanaka, Cal. Hort. B. 7, 462, 1918.
- Kaliofenusa ulmi***
Chrystal, Agr. Gaz. Can. 6, 725, 1919.
Hewitt, Can. Ent. R. f. 1916, 41, 1917.
Lochhead, Ont. Ent. Soc. R. 48, 88, 1918.
MacGillivray, Conn. Geol. Nat. Hist. Surv. B. 22, 157, 1916.
Weiss, Psyche 22, 105, 1915.
Weiss, N. J. Dept. Agr. C. 26, 23, 1919.

- Kaliosysphinga dohrnii**, *see* **Fenusa dohrnii**
Kaliosysphinga ulmi, *see* **Kaliofenusa ulmi**
Kalotermes flavicollis
 Snyder, U. S. D. A. B. 333, 24, 1916.
Kalotermes marginipennis
 Snyder, U. S. D. A. B. 333, 15, 1916.
Kalotermes sp.
 Snyder, U. S. F. B. 759, 5, 1916.
 Snyder, U. S. F. B. 1937, 1919.
Kansas bait
 Felt, N. Y. R. 31, 61, 1916.
 Watson Fla. Gr. 16, 11, 2, 1917.
Kermes concinnulus
 Lawson, Kans. Univ. Dept. Ent. B. 11, 185, 1917.
Kermes essigii, *parasite*
 Timberlake, Proc. U. S. Nat. Mus. 50, 584, 1916.
Kermes galliformis
 Hollinger, Ent. News 30, 92, 1919.
 Lawson, Kans. Univ. Dept. Ent. B. 11, 185, 1917.
 Timberlake, Proc. U. S. Nat. Mus. 50, 584, 1916.
 Wilson, Fla. St. Pl. Bd. Quar. B. 2, 32, 1917.
Kermes kingii
 Olsen, Brooklyn Ent. Soc. B. 14, 141, 1919.
Kermes miyasakii, *parasite*
 Timberlake, Proc. U. S. Nat. Mus. 50, 583, 1916.
Kermes nivalis
 Lawson, Kans. Univ. Dept. Ent. B. 11, 183, 1917.
Kermes pubescens
 Houser, Ohio B. 332, 305, 1918.
 Lawson, Kans. Univ. Dept. Ent. B. 11, 184, 1917.
Kermes, spp.
 Howard, Ent. News, 30, 255, 1919.
 Timberlake, Proc. U. S. Nat. Mus. 50, 581, 1916.
Kerosene
 Coe, Cal. Cult. 7, 476, 1919.
 Freeborn and Atsatt, J. Ec. Ent. 11, 304, 1918.
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 Morrill, Southw. Stock-Farm. 32, 170, 1916.
 Osborn, Agr. Ent. 319, 1916.
 Quaintance & Siegler, U. S. F. B. 908, 28, 1918.
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 Gillette & List, Colo. B. 210, 46, 1915.
Kerosene and gas tar
 Armstrong, Florists' Rev. 35, 896, 20, 1915.
Kerosene and sour cream
 Markham, Gardening 30, 111, 1919.
Kerosene emulsion
 Baker, Ont. Ent. Soc. R. 47, 53, 1917.
 Baldwin, Ind. Ent. R. 8, 177, 1916.
 Bentley, Tenn. B. 117, 114, 1917.
 Britton & Zappe, Conn. B. 211, 296, 1919.
 Chase, Ga. Bd. Ent. B. 54, 19, 1919.
 Chittenden, U. S. F. B. 914, 13, 1918.
 Cotton, Porto Rico Dept. Agr. J. 2, 268, 1918.
 Craneheld, Wis. Hort. Soc. R. 49, 19, 1919.
 Edmundson, Ida. B. 87, 30, 1916.
 Elliott, Ky. Ext. C. 67, 37, 1919.
 Essig, Inj. & Ben. Ins. Cal. ed. 2, 469, 1915.
 Eustace & Pettit, Mich. Sp. B. 73, 21, 1915.
 Forbes, Ill. Ent. R. 29, 105, 1916.
 Gillette & List, Colo. B. 210, 46, 1915.
 Herrick, Ins. Econ. Import. 21, 1915.
 Leach, U. S. D. A. B. 730, 37, 1918.
 Lowry, Conn. R. 14, 151, 1915.
 McDowell, Pa. State Ext. C. 55, 6, 1917.
 McGregor & McDonough, U. S. D. A. B. 416, 64, 1917.
 Melander & Heald, Wash. Pop. B. 100, 8, 1916.
 Paddock, Texas B. 179, 8, 1919.
 Quayle, Cal. B. 255, 418, 1915.
 Regan, Mass. B. 177, 142, 1918.
 Rosenau, Prev. Med. & Hyg. 220, 1917.
 Sanders, Wis. Dept. Agr. B. 3, 12, 1916.
 Sanders, Wis. Dept. Agr. C. 2, 1916.
 Scott and Siegler, U. S. D. A. B. 278, 26, 1915.
 Sherman, N. C. Ext. C. 66, 15, 1918.
 Smith, Essig & Gray, Cal. C. 204, 27, 1918.
 Talbert, Mo. Ext. Ser. C. 15, 3, 1917.
 Troop & Mason, Ind. C. 64, 13, 1917.
 Van Zwaluwenburg & Thomas, Porto Rico C. 17, 10, 1918.
 Washburn, Inj. Ins. 45, 1918.

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- Forbes, Ill. B. 186; 225, 230, 257, 1916.
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Phyllophaga gracilis

- Davis, J. Ec. Ent. 9, 264, 1916.

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- Davis, J. Ec. Ent. 9, 262, 1916.
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Phyllophaga hirtiventris

- Forbes, Ill. B. 186, 235, 1916.
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Phyllophaga horni

- Forbes, Ill. B. 186, 234, 1916.
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Phyllophaga ilicis

- Davis, J. Ec. Ent. 9, 262, 1916.
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- Davis, J. Ec. Ent. 9, 262, 1916.
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- Davis, J. Ec. Ent. 9, 262, 1916.
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Phyllophaga lanceolata

- Hayes, J. Ec. Ent. 12, 109, 1919.
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Phyllophaga longitarsa

- Forbes, Ill. B. 186, 234, 1916.
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Phyllophaga media

- Smyth, Porto Rico Bd. Com. Agr. R. 4, 48, 1916.

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- Felt, N. Y. R. 30, 21, 1915.
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 Forbes, Ill. Ent. R. 29, 35, 1916.

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- Colon, Porto Rico R. 1917-18, 50, 1919.

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- Dean, Kans. St. Bd. Agr. R. 35, 373, 1916.

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- Criddle, Agr. Gaz. Can. 5, 450, 1918.
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- Smyth, Porto Rico Bd. Com. Agr. R. 4, 48, 1916.

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Phyllophaga profunda

- Forbes, Ill. B. 186, 229, 1916.
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Phyllophaga prunina

- Forbes, Ill. B. 186, 234, 1916.
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- Davis, J. Ec. Ent. 9, 264, 1916.

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Phyllophaga sp., parasites

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Phyllophaga tristis

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Felt, N. Y. R. 30, 21, 1915.

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Davis, J. Ec. Ent. 9; 262, 268, 1916.

Forbes, Ill. B. 186; 229, 231, 1916.

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Phylloscelis atra

Scammell, U. S. D. A. B. 554, 16, 1917.

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Phyllotreta armoraciae

Chittenden & Howard, U. S. D. A. B. 535, 1917.

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Britton, Conn. R. 14, 189, 1915.
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Gill, U. S. F. B. 843, 31, 1917.
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Phylloxera salicola

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Phylloxera sp.

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Caffrey & Barber, U. S. D. A. B. 779, 31, 1919.

Coad, U. S. D. A. B. 344, 23, 1916.

Phymata wolffi

Chittenden, U. S. F. B. 766, 9, 1916.

Phymatodes amoenus

Somes, Mo. Fruit B. 25, 12, 1915.

Phymatodes dimidiatus

Blackman & Stage, N. Y. Col. For. Tech. Pub. 10, 64, 1918.

Physalis pubescens

Webster, Iowa B. 155, 412, 1915.

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Peairs & Merrill, Kans. B. 214, 14, 1916.
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- Phytomyza aquilegiae**
Cory, Md. Hort. Soc. R. 18, 162, 1915.
Cory, J. Ec. Ent. 9, 419, 421, 1916.
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Weiss, J. Ec. Ent. 9, 213, 1916.
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Hewitt, Can. Ent. R. f. 1916, 34, 1917.
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Weiss, J. N. Y. Ent. Soc. 24, 149, 1916.
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Felt, N. Y. R. 32, 80, 1918.
Herrick, J. Ec. Ent. 12, 207, 1919.
- Phytonomus murinus**, *see* *Phytonomus posticus*
- Phytonomus nigrirostris**
Cooley, Mont. B. 109, 154, 157, 1916.
Cooley, Mont. B. 112, 67, 1916.
DuPorte, Ont. Ent. Soc. R. 46, 49, 1916.
Herrick, J. Ec. Ent. 12, 206, 1919.
- Phytonomus posticus***
Benson, Wash. Dept. Agr. Bien. R. 3, 14, 1918.
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Cook, Cal. Hort. B. 4, 269, 1915.
Cooley, Mont. B. 112, 62, 1916.
Cooley, Mont. Bd. Hort. Bien. R. 9, 20, 1917.
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Hall, Cal. Hort. B. 6, 233, 1917.
Hecke, Cal. Hort. B. 6, 32, 1917.
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Israelien & Alder, Utah C. 39, 39, 1918.
Linfield, Mont. R. 25, 162, 1918.
List & Wakefield, Colo. Ext. C. 27, 13, 1919.
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Nelson, Wyo. Hort. Bd. Bien. R. 6, 23, 1916.
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Smith, Cal. Hort. B. 6, 295, 1917.
Stevens, Cal. Hort. B. 7, 546, 1918.
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Gage, Amer. Thresh. 18, 1, 9, 1915.
Kalmbach, So. Dak. Farm. 13, 4, 7, 1915.

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Hagan, Cal. Hort. B. 8, 469, 1919.

Phytonomus posticus, quarantine

Cannon & Davis, Idaho Farm. 25, 26, 15, 1919.

Cooley, Mont. B. 126, 33, 1918.

Dean, Mont. Hort. Bd. Bien. R. 9, 19, 1917.

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Weldon, Cal. Hort. B. 7, 484, 1918.

Wicks, Better Fruit 14, 4, 6, 1919.

—— Miss. St. Plant. Bd. C. 2, 7, 1919.

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Phytonomus punctatus, see Hypera punctata**Phytonomus quadricollis**

Criddle, Can. Ent. 47, 25, 1915.

Phytonomus variabilis

Rockwood, J. Ec. Ent. 9, 494, 1916.

Phytophaga destructor*

Bentley, Tenn. Dept. Agr. 1917-18, 66.

Call, Salmon & Cunningham, Kans. B. 213, 1916.

Cotton, Ohio Dept. Agr. Off. B. 11, 7, 5, 1919.

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Garman, Ky. R. 29, 51, 1916.

Gossard, J. Ec. Ent. 9, 142, 1916.

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Haseman, Mo. St. Bd. Agr. R. 48, 476, 1916.

Haseman, J. Ec. Ent. 12, 218, 1919.

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Hopkins, Sci. Month. 8, 509, 1919.

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Howard, U. S. D. A. Ann. R. 1915, 221, 1916.

Huard, Dept. Agr. Prov. Quebec. B. 23, 34, 1916.

Jordan, Mo. St. Bd. Agr. R. 48, 368, 1916.

Kelly, J. Agr. Res. 4, 222, 1915.

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Luginbill, S. C. Comn. Agr. Com. & Indus. R. 15, 114, 1918.

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Meyer, Mo. Ext. Project 12, 42, 1919.

Nelson, Ark. B. 158, 48, 1918.

Packard, Cal. Hort. B. 7, 174, 1918.

Parks, J. Ec. Ent. 10, 249, 1917.

Parks, J. Ec. Ent. 11, 159, 1918.

Sherman, N. C. Dept. Agr. B. 247, 1918.

Snodgrass, Ind. Ent. R. 9, 143, 1917.

Talbert, J. Ec. Ent. 9, 290, 1916.

Troop, Ind. R. 31, 30, 1918.

Vrooman, U. S. F. B. 704, 32, 1916.

Walton, U. S. F. B. 835, 3, 1917.

Webster, U. S. F. B. 640, 1915.

Webster & Kelly, U. S. D. A. Off. Sec. C. 51, 1915.

Phytophaga destructor and resistant wheat

Haseman & Hollinger, Mo. B. 141, 1916.

Phytophaga destructor and winter wheat

Hopkins, U. S. D. A. Mo. Weather Rev. Sup. 9, 23, 1918.

Phytophaga destructor, cooperation in control

Davis, J. Ec. Ent. 11, 408, 1918.

Phytophaga destructor, parasites

Packard, J. Agr. Res. 6, 367, 1916.

Phytophaga destructor, winged and wingless

Yuasa, J. Animal Behav. 7, 307, 1917.

Phytophaga sp., migration of larvae

McColloch & Yuasa, J. Animal Behav. 7, 307, 1918.

Phytoptus, see Eriophyes**Pickle worm, see Diaphania nitidalis****Pieris, see Pontia****Pilocrocis tripunctata**

Cotton, Porto Rico, Dept. Agr. J. 2, 309, 1918.

Cotton, Rev. Agr. Puerto Rico 1, 260, 1918.

Jones, U. S. D. A. B. 192, 9, 1915.

Jones, U. S. D. A. B. 609, 1917.

Pimpla annulipes, see Pimplidea aequalis**Pimpla conquisitor, see Itopectis conquisitor****Pimpla inquisitor, see Iseropus coelebs and Epiurus inquisitoriellus****Pimpla pedalis, see Pimplidea pedalis****Pimpla roborator, see Exeristes roborator****Pimpla sp.**

Blakeslee, U. S. D. A. B. 261, 12, 1915.

Busck, J. Agr. Res. 9, 359, 1917.

Chittenden, U. S. D. A. B. 363, 15, 1916.

DuPorte, Quebec Soc. Protec. Pl. R. 7, 77, 1915.

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Felt, N. Y. R. 29, 61, 1915.

Treherne, Proc. Ent. Soc. B. C. 9, 67, 1916.

Pimplidea aequalis

Britton, Conn. R. 16, 109, 1917.

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King, Ohio B. 307, 422, 1917.

Quaintance, U. S. F. B. 662, 7, 1915.

Stearns, J. Ec. Ent. 12, 348, 1919.

Watson, J. Ec. Ent. 9, 527, 1916.

Pimplidea pedalis

Gibson, Can. Dept. Agr. Ent. B. 9, 15, 1915.

Isely, U. S. D. A. B. 598, 11, 1918.

Quaintance, U. S. F. B. 662, 7, 1915.

Pimplidea tenuicornis

Cushman, Proc. Ent. Soc. Wash. 20, 10, 1918.

Britton, Conn. R. 16, 109, 1917.

Pinctus carolinus

Colon, Porto Rico R. 1917-18, 35, 1919.

Morrill, Porto Rico Bd. Com. Agr. R. 3, 55, 1915.

Pine bark aphid, see Pineus strobi**Pine leaf scale, see Chionaspis pinifoliae****Pine tar and cotton seed-oil**

Graybill, U. S. D. A. B. 131, 14, 1914.

Imes, U. S. F. B. 980, 6, 1918.

Lockett, J. Jam. Agr. Soc. 23, 56, 1919.

Pine tar creosote emulsion

Cory, Peninsula Hort. Soc. Tr. 30, 63, 1917.

Pineus pinifoliae

O'Kane, N. H. Dept. Agr. Ins. Sup. C. 11, 22, 1915-16.

O'Kane, N. H. Dept. Agr. Bien. R. 1916, 142.

O'Kane, N. H. Moth C. 11, 22, 1916.

Pineus similis

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Felt, N. Y. R. 29, 48, 1915.

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Clausen, Cal. B. 258; 19, 35, 41, 1915.

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***Pseudococcus* sp.**

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McMahan, Kans. Farm. 57, 26, 6, 1919.

Soap, soda carbol wash

Somes, Mo. Fruit B. 25, 5, 1915.

Soap solution

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Forbes, Ill. Ent. R. 29, 106, 1916.

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Ruggles & Stakman, Minn. Hort. Soc. Trans. 43, 135, 1915.

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Gilbert & Popenoe, U. S. D. A. C. 35, 29, 1919.

Quaintance & Siegler, U. S. F. B. 908, 1918.

Sherman, N. C. Dept. Agr. B. 209, 37, 1915.

Soap sticker

Baldwin, Ind. Ent. R. 8, 178, 1916.

Soap washes

Essig, Inj. & Ben. Ins. Cal. ed. 2, 472, 1915.

Quaintance, U. S. F. B. 650, 26, 1915.

Soaps

deOng, Cal. Hort. B. 5, 172, 1916.

Herrick, Ins. Econ. Import. 20, 1915.

Social wasps

Bastin, Sci. Amer. Sup. 87, 196, 1919.

Soda-sulphur solution

Yothers, U. S. F. B. 933, 22, 1919.

Soda wash

Scott & Siegler, U. S. D. A. B. 278, 35, 1915.

Sodium and potassium cyanide

Brown, Market Gr. Jour. 21, 8, 1917.

Sodium arsenate-kerosene emulsion

Craighead, J. Ec. Ent. 8, 513, 1915.

Sodium arsenite

Flint, J. Ec. Ent. 11, 187, 1918.

Sanders & Fracker, Wis. Dept. Agr. B. 10, 51, 1916.

Smith, Essig & Gray, Cal. C. 204, 21, 1918.

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Sodium cyanide

Beckwith, Am. Cranberry Gr. Assoc. Proc. 49, 14, 1919.

Bentley, Tenn. Bd. Ent. B. 18, 1916.

Berger, Fla. St. Pl. Bd. Quar. B. 1, 21, 1917.

Braun, Woodworth School of Fumig. 43, 1915.

Leach, U. S. D. A. B. 730, 35, 1918.

Peterson, N. J. R. 1917, 469.

Safford, Florists' Exc. 41, 1135, 1916.

Sasscer, U. S. Fed. Hort. Bd. S. R. A. 21, 83, 1915.

Vosler, Cal. Hort. B. 4, 393, 1915.

Watson, Fla. B. 151, 201, 1919.

Wilson, Horticulture 22, 844, 1915.

Sodium fluoride

Bishopp & Wood, Psyche 24, 187, 1917.

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Haacke, Dak. Farm. 38, 923, 1918.

Lippincott, Kans. Indust. 44, 35, 1, 1918.

Lowther, Oreg. Farm. 28, 16, 10, 1917.

Musschl, Neb. Ruralist 53, 12, 15, 1919.

Orr, Farm & Fireside 40, 18, 14, 1917.

Pierce, La. St. Bd. Health Quar. B. 10, 82, 1919.

Salmon, U. S. F. B. 957, 40, 1918.

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Wells, Neb. Farm Jour. 25, 15, 9, 1919.

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Sodium salicylate

Phelps & Stevenson, Pub. Health R. 31, 3033, 1916.

Phelps & Stevenson, J. Am. Med. Assoc. 71, 622, 1918.

Sodium sulphid

Quaintance & Siegler, U. S. F. B. 908, 27, 1918.

Soil fumigation

deOng, J. Agr. Res. 11, 421, 1917.

French, Cal. Hort. B. 5, 227, 1916.

Soil infesting insects

Cameron, Agr. Gaz. Can. 4, 663, 1917.

Lipman, N. J. B. 317, 40, 1917.

Peterson, N. J. R. 1917, 469.

***Solenococcus* sp.**

Sasscer, J. Ec. Ent. 11, 127, 1918.

Solenopsis debilis

Brooks, U. S. D. A. B. 730, 14, 1918.

Felt, N. Y. R. 30, 68, 1915.

Solenopsis debilis (*Cont'd.*)

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Solenopsis fugax

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Solenopsis geminata

Colon, Porto Rico R. 1917-18, 30, 32, 38, 121, 1919.

Cotton, J. Dept. Agr. Porto Rico 2, 296, 1918.

Cotton, Rev. Agr. Puerto Rico 1; 124, 207, 1918.

Earle & Rogers, San Pedro Citrus Path. Lab. R. 1, 19, 1915.

Hebard, Ent. News 28, 363, 1917.

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Paddock, Texas B. 227, 57, 1918.

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Wood, U. S. D. A. B. 503, 11, 1917.

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Tucker, Kans. Acad. Sci. Trans. 28, 303, 1918.

Solenopsis geminata rufa

Marlatt, U. S. F. B. 740, 3, 1916.

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Brooks, U. S. D. A. B. 730, 13, 1918.

Brooks & Blakeslee, U. S. D. A. B. 189, 49, 1915.

Flint, J. Ec. Ent. 11, 415, 1918.

Hayes, J. Ec. Ent. 9, 127, 1916.

McColloch & Hayes, J. Ec. Ent. 9, 23, 1916.

Marlatt, U. S. F. B. 740, 7, 1916.

Schoene, N. Y. Geneva B. 419, 152, 1916.

Solenopsis sp.

Bishopp, J. Ec. Ent. 10, 304, 1917.

Paddock, Texas B. 158, 25, 1913.

Solid-stream spraying

Worthley, U. S. D. A. B. 480, 1917.

Solubea pugnax

Stoner, Can. Ent. 51, 219, 1919.

Soluble sulphur

Herrick, Ins. Econ. Import. 25, 1915.

Mitchell, Farm & Dairy 34, 186, 1915.

Morse & Shapovalov, Me. B. 240, 191, 1915.

Stewart, Penn. Farm. 39, 158, 1916.

Soluble-sulphur and calcium arsenate

Caesar, Ont. Ent. Soc. R. 47, 36, 1917.

Soluble sulfur compound

Miller, Cal. Hort. B. 6, 25, 1917.

Sherman, N. C. Ext. C. 66, 12, 1918.

Somalia enigmatica

Riley & Johannsen, Med. Ent. 307, 1915.

Sorghum insects

Swaim, Okla. Ext. C. 74, 17, 1918.

Sorghum midge, see Contarinia sorghicola**Southern clothes moth, see Tineola biselliella****Southern hen flea, see Echidnophaga gallinacea, Xestopsylla gallinacea****Southern tobacco or tomato worm, see Protoparce sexta****Southwestern lubber glasshopper, see Brachystola magna****Sowbugs**

Chittenden, Gardening 24, 105, 1915.

Clarke, Garden Mag. 23, 262, 1916.

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Cook, Cal. Hort. B. 4, 200, 1915.

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Popenoe, U. S. F. B. 789, 9, 1917.

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Aldrich, Ann. Ent. Soc. Amer. 8, 83, 1915.

Spanioneura fonscolombii

Britton, Conn. R. 15, 186, 1916.

Spanish fly, see Epicauta sp. and Lytta vesicatoria**Sparganothis spp.**

Busck, Proc. Ent. Soc. Wash. 17, 85, 86, 1915.

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Moznette, Fla. Bug. 3, 57, 1919.

Sparnopolius fulvus

Colon, Porto Rico R. 1917-18, 51, 1919.

Davis, J. Ec. Ent. 9, 271, 1916.

Davis, Ill. Nat. Hist. Surv. B. 13, 87, 1919.

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Spartocera batatas

Cotton, Rev. Agr. Puerto Rico 1, 261, 1918.

Jones, U. S. D. A. B. 192, 4, 1915.

Spartocera fusca

Cotton, J. Dept. Agr. Puerto Rico 2, 310, 1918.

Spathius sp.

Blackman & Stage, N. Y. St. Col. For. Tech. Pub. 10, 102, 1918.

Clemens, N. Y. C. B. 383, 297, 1916.

Spathius tomici

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Spathius trifasciatus

Felt, N. Y. R. 29, 29, 1915.

Spermophagus pectoralis

Back & Duckett, U. S. F. B. 983, 16, 1918.

Smyth, Porto Rico R. 1917-18, 116, 1919.

Spermophagus piurae

Pierce, U. S. D. A. Sec. R. 102, 8, 1915.

Sphaerococcus casuarinae

Ferris, Can. Ent. 51, 249, 1919.

Sphaerophoria cleoeae

Metcalf, Ent. News 28, 210, 1917.

Sphaerophoria cylindrica

Britton & Lowry, Conn. B. 203, 299, 1917.

Davis, U. S. D. A. B. 276, 53, 1915.

Houser, Guyton & Lowry, Ohio B. 317, 79, 1917.

McGregor & McDonough, U. S. D. A. B. 416, 53, 1917.

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Sphaerophoria interrupta

Jones, Ann. Ent. Soc. Amer. 10, 225, 1917.

Sphaerophoria melanosa

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Sphaerophoria micrura

Davidson, J. Ec. Ent. 9, 455, 1916.

Sphaerophoria sulphuripes

Davidson, J. Ec. Ent. 9, 454, 1916.

Sphaerostible coccophila

Quaintance, U. S. F. B. 650, 13, 1915.

Reed & Crabill, Va. R. 1913-1914, 58, 1915.

Scammell, U. S. F. B. 860, 37, 1917.

Yothers, U. S. F. B. 933, 5, 1918.

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Sphagnum cricket, see Nemobius palustris**Spharagemon bolli**

Ewing & Hartzell, J. Ec. Ent. 11, 263, 1918.

Morse, Psyche 26, 34, 1919.

Sphecius speciosus

Howes, Insect Behavior 91, 1918.

Mance, Ent. News 26, 266, 1915.

Sphecodes dichroa

Stohr, Quebec Soc. Protec. Pl. R. 11, 44, 1919.

Sphenophorus aequalis

Satterthwait, U. S. F. B. 1003, 10, 1919.

Sphenophorus callosus

Crocker, Or. Judd Farm. 58, 20, 2, 1915.

Hyslop, U. S. D. A. B. 156, 21, 1915.

Metcalf, N. C. R. 38, 23, 1915.

Metcalf, N. C. Agr. Ext. C. 19, 1916.

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Sphenophorus cariosus

Holloway & Loftin, J. Ec. Ent. 12, 449, 1919.

Sphenophorus costicollis

Chittenden, Wash. Biol. Soc. Proc. 32, 269, 1919.

Sphenophorus discolor

Satterthwait, U. S. F. B. 1003, 15, 1919.

Sphenophorus destructor

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Sphenophorus maidis

Hayes, J. Ec. Ent. 9, 120, 1916.

McColloch, Farm. Mail, 45, 16, 18, 1915.

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Satterthwait, U. S. F. B. 1003, 11, 1919.

Worsham, Ga. Bd. Ent. B. 42, 20, 1915.

Sphenophorus minimus

Satterthwait, U. S. F. B. 1003, 19, 1919.

Sphenophorus obscurus, see Rhabdocnemis obscurus**Sphenophorus ochreus**

Haseman, Mo. B. 134, 11, 1915.

Sphenophorus parvulus

Haseman, Mo. B. 134, 11, 1915.

Satterthwait, U. S. F. B. 1003, 8, 1919.

Sphenophorus pertinax

Hayes, J. Ec. Ent. 9, 120, 1916.

Satterthwait, U. S. F. B. 1003, 16, 1919.

Sphenophorus phoeniciensis

Morrill, Ariz. Comm. Agr. & Hort. R. 7, 39, 1915.

Satterthwait, U. S. F. B. 1003, 18, 1919.

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Satterthwait, U. S. F. B. 1003, 15, 1919.
- Sphenophorus robustus**
Hayes, J. Ec. Ent. 9, 120, 1916.
Watson, Fla. B. 134, 80, 1917.
- Sphenophorus sculptilis**
Britton, Conn. R. 14, 189, 1915.
- Sphenophorus sordidus**, *see* **Cosmopolites sordidus**
- Sphenophorus sp.**
Britton, Conn. R. 14, 189, 1915.
Felt, N. Y. R. 33, 53, 1918.
Knaus, Brooklyn Ent. Soc. B. 10, 39, 1915.
Sanborn, Okla. Ext. C. 41, 30, 1916.
Webster, Iowa C. 23 rev. 11, 1916.
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Chittenden, Wash. Biol. Soc. Proc. 32, 269, 1919.
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Watson, U. S. F. B. 835, 18, 1917.
Watson, Fla. B. 151, 157, 1919.
Webster, Iowa C. 23, 10, 1915.
Williamson, Minn. Ent. C. 39, 9, 1916.
Williamson, Minn. Ent. Sp. B. 8, 9, 1916.
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Satterthwait, U. S. F. B. 1003, 18, 1919.
- Sphenophorus zeae**
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Jones, Amer. Threshm. 20, 11, 10, 1918.
Satterthwait, U. S. F. B. 1003, 9, 1919.
- Sphenostethus taslei**
Craighead, U. S. D. A. Sec. R. 107, 21, 1915.
- Sphex ichneumon**, *see* **Ammobia ichneumonia**
- Sphex luctuosa**, *see* **Psammophila luctuosa**
- Sphex sp.**
Hewitt, Can. Ent. R. f. 1916, 63, 1917.
Hinds & Dew, Ala. Poly. B. 186, 89, 1915.
- Sphinx cerisyi**, *see* **Smerinthus cerisyi**
- Sphinx convolvuli**, *see* **Herse convolvuli**
- Sphinx drupiferarum**
Severin, S. D. Ent. R. 9, 14, 1917.
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Smith, Proc. Ent. Soc. Wash. 19, 126, 1917.
- Spilochalcis deliria**
Marsh, J. Agr. Res. 10, 8, 1917.
Vickery, J. Ec. Ent. 8, 391, 1915.
- Spilochalcis mariae**
Howard, U. S. F. B. 701, 7, 1916.
- Spilochalcis pallens**
Vickery, J. Ec. Ent. 8, 391, 1915.
- Spilochalcis vittata**
Gill, U. S. D. A. B. 571, 15, 1917.
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Cushman, Proc. U. S. Nat. Mus. 55, 529, 1919.
- Spilocryptus extrematis**
Quaintance, U. S. F. B. 662, 7, 1915.
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Cushman, Proc. U. S. Nat. Mus. 53, 461, 1917.
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Britton, Conn. B. 211, 303, 1919.
Newcomer, U. S. D. A. B. 265, 33, 1915.
Wood, Cal. Hort. B. 7, 527, 1918.
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- Spinach leaf miner**, *see* **Pegomyia hyoscyami**
- Spiniger arizonica, bicolor**
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Blackman & Stage, N. Y. St. Col. For. Tech. Pub. 10, 104, 1918.
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Howes, C. Life Amer. 28, 1, 66, 1915.
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- Spotted fever tick**, *see* **Dermacentor venustus**
- Spotted ladybird**, *see* **Megilla maculata**
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 Caesar, Ont. Dept. Agr. B. 250, 50, 1917.
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 Childs, Oreg. B. 141, 29, 1917.
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 Crane, West Va. C. 12, 1914.
 Craneheld, Wis. Hort. Soc. R. 49, 24, 1919.
 Dean, Mont. Hort. Bd. Bien. R. 9, 33, 1917.
 Dean, Kans. Hort. Soc. Trans. 34, 206, 1918.
 Dudley, Me. Dept. Agr. B. 17, 3, 69, 1918.
 Dudley, Me. St. Dept. Agr. R. 13, 51, 1918.
 Dudley, Me. Dept. Agr. B. 18, 4, 70, 1919.
 Dudley, Me. Dept. Agr. R. 18, 25, 1919.
 Elliott, Ky. C. 67, 38, 1919.
 Faurot, Mo. St. Bd. Agr. B. 17, 35, 1919.
 Fulton, N. Y. Geneva C. 37, 12, 1918.
 Garman, Ky. Agr. & Labor Stat. Bien R. 22, 434, 1918.
 Gold & Wheeler, W. Va. Dept. Agr. B. 35, 1917.
 Gourley, N. H. Ext. C. 10, 1914.
 Green, Selby & Gossard, Ohio B. 309, 1917.
 Headlee, Blake & Cook. N. J. C. 45, 1915.
 Herrick, Ins. Econ. Import. 131, 1915.
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 Herron, Miss. Ext. C. 20, 1917.
 Hodgkiss, N. Y. St. Fr. Gr. Assoc. Proc. 14, 300, 1915.
 Hodgkiss, N. Y. St. Fr. Gr. Assoc. Proc. 15, 312, 1916.
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 Hollister, Conn. Ext. C. 14, 1917.
 Isbell, Ala. Poly. Ext. C. 29, 1919.
 Lewis, Chase & Turner, Ga. Bd. Ent. B. 53, 1919.
 McDowell, Pa. State Ext. C. 56, 7, 1917.
 McHatton, & Firor, Ga. Ext. C. 8, 1915.
 McHatton, & Firor, Ga. Ext. C. 62, 1917.
 McHatton & Firor, Ga. St. Col. B. 170, 1919.
 McHatton, Firor & Kiger, Ga. St. Col. B. 134, 27, 1917.
 McHatton, Firor & Ragsdale, Ga. St. Col. B. 120, 27, 1917.
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 Ralston & Marshall, Va. Poly. Ext. B. 14, 38, 1917.
 Rolfs, Fla. Agr. Ext. B. 18, 1919.
 Rose, Mo. Fruit C. 9, 1918.
 Ruggles, Minn. Ins. Life 4, 1, 5, 1917.
 Ruggles & Graham, Minn. Ext. Sp. B. 29, 32, 1918.
 Ruggles & Stakman, Minn. Hort. Soc. Trans. 43, 136, 1915.
 Ruggles & Stakman, Minn. Hort. 45, 225, 1917.
 Sanborn, Okla. C. 38, 1916.
 Sanborn, Okla. C. 39, 1916.
 Severin, So. Dak. Ent. R. 10, 33, 1919.
 Shaw, Ohio Bd. Agr. Bur. Insecticides R. f. 1915, 14, 1916.
 Shaw, Ohio Dept. Agr. Off. B. 7, 1, 26, 1916.
 Somes, Mo. Fruit C. 9, 1915.
 Starcher et al., Ala. Poly. Ext. C. 19, 1918.
 Starcher et al., Ala. Poly. Ext. C. 20, 49, 1918.
 Starcher et al., Ala. Poly. Ext. C. 21, 58, 1918.
 Stewart, N. Y. Dept. Agr. B. 97, 35, 1917.
 Talbert, Mo. Ext. C. 15, 12, 1917.

Spray calendar (Cont'd.)

- Vincent & Edmundson, Ida. C. 1, 1915.
 Vincent & Willis, Ida. C. 6, 1918.
 Watson, Fla. Dept. Agr. Quar. B. 25, 2, 191, 1915.
 White, Miss. Ext. C. 23, 1919.
 Winberg, Ala. Poly. Ext. C. 17, 1918.
 ——— N. J. C. 75, 1917; 76, 1917; 77, 1917; 78, 1917; 79, 1917; 93, 1918; 94, 1918.
 ——— N. Y. Cornell Post Cd. 1914.
 ——— Okla. Ext. C. 38, 1916.
 ——— Va. Dept. Agr. B. 138, 50, 1919.
 ——— Va. Hort. Soc. B. 1915, 1, 6.
 ——— Va. Hort. Soc. B. 4; 1, 9, 12, 1916.
 ——— Va. Hort. Soc. R. 20, 214, 1916.
 ——— Va. Hort. Soc. B. 5, 1, 8, 1917.
 ——— Wash. Pop. B. 77, 1915.

Spray calendar, apple

- Baldwin, Ind. Ent. R. 8, 129, 1916.
 Bentley, Tenn. B. 121, 30, 1918.
 Cate & Moren, Jackson Co. Oreg. Path. & Ent. C. 1, 1919.
 Dudley, Me. Dept. Agr. R. 16, 51, 1918.
 Fulton, N. Y. Geneva C. 57, 12, 1918.
 Hadley, Penn. Hort. Assoc. Proc. 58, 127, 1917.
 Lassetter, Ark. Ext. C. 57, 1919.
 Richards, Ind. Hort. Soc. Tr. 1915, 445, 1916.
 Sanders & Brittain, Can. Dept. Agr. Ent. Br. Pub. 1919.
 Sherman, N. C. Ext. C. 66, 7, 1918.

Spray calendar—cabbage

- Baldwin, Ind. Ent. R. 8, 172, 1916.

Spray calendar, cherry

- Baldwin, Ind. Ent. R. 8, 135, 1916.
 ——— Ind. Hort. Soc. Tr. 1917, 391.

Spray calendar, cucumber

- Lassetter, Ark. Ext. C. 61, 1919.

Spray calendar, garden crops

- Lassetter, Ark. Ext. C. 62, 1919.

Spray calendar, gooseberries

- Baldwin, Ind. Ent. R. 8, 157, 1916.

Spray calendar, grape

- Baldwin, Ind. Ent. R. 8, 154, 1916.
 Bentley, Tenn. B. 121, 19, 1918.
 Lassetter, Ark. Ext. C. 60, 1919.

Spray calendar, melons

- Baldwin, Ind. Ent. R. 8, 171, 1916.

Spray calendar, orchard

- Carmody, Ky. Ext. C. 24, 1914.
 Carmody, Ky. Ext. C. 29, 1915.
 Gossard & Green, Ohio Mo. B. 1, 103, 1916.
 Sanborn & Mooring, Okla. Farm.-Stock 32, 1218, 1919.
Spray calendar, peach
 Baldwin, Ind. Ext. R. 8, 143, 1916.
 Bentley, Tenn. B. 121, 36, 1918.
 Hadley, Penn. Hort. Assoc. Proc. 58, 129, 1917.
 Richards, Ind. Hort. Soc. Tr. 1915, 430, 1916.
 Sherman, N. C. Ext. C. 66, 9, 1918.
 Stabler, Cal. Cult. 44, 199, 1915.
 ——— Ind. Hort. Soc. Tr. 1917, 390.

Spray calendar, pear

- Fisher & Newcomer, U. S. F. B. 1056, 33, 1919.

Spray calendar, plum

- Lassetter, Ark. Ext. C. 59, 1919.
 ——— Ind. Hort. Soc. Tr. 1917, 391.

Spray calendar, potatoes

- Baldwin, Ind. Ent. R. 8, 170, 1916.

Spray calendar, raspberries

- Baldwin, Ind. Ent. R. 8, 164, 1916.

Spray calendar, strawberries

- Baldwin, Ind. Ent. R. 8, 170, 1916.

Spray calendar, vegetables

- Sanborn & Mooring, Okla. Ext. C. 110, 1919.
 Sanborn & Mooring, Okla. Farm.-Stock 32, 1220, 1919.

Spray, dormant*

- Becker, Ark. B. 141, 1918.
 Bentley, Tenn. Dept. Agr. Bien. R. 1917-18, 72.
 Blair, Nova Scotia Fr. Gr. Assoc. R. 51, 172, 1915.
 Crosby & Mix, N. Y. C. B. 356, 129, 1915.
 Drinkard, Va. Hort. Soc. B. 5, 1, 5, 1917.
 Merrill, Kans. C. 66, 6, 1918.
 Parrott, N. Y. Dept. Agr. B. 97, 33, 1917.
 Regan, Mass. B. 184, 47, 1918.
 Scott, Adams Co. Fr. Gr. Assoc. Proc. 10, 49, 1914.

Spray formulas*

- Baldwin, Mich. Ext. B. 14, 1918.
 Bentley, Tenn. Bd. Ent. B. 27, 24, 1918.

- Bentley, Tenn. B. 121, 40, 1918.
 Chase, Ga. Bd. Ent. B. 54, 9, 1919.
 Cook, Can. Hort. 39, 23, 1916.
 Cory, Del. Dept. Agr. B. 6, 3, 62, 1916.
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 Howard, Neb. Hort. Soc. R. 50, 40, 1919.
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- Sherman, N. C. Agr. Ext. C. 66, 1918.
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- Stahl, Wash. Mo. B. 3, 12, 4, 1915.
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 Paddock, Texas B. 187, 22, 1916.
 Peairs & Merrill, Kans. B. 214, 23, 1916.
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 Sherman, N. C. Dept. Agr. C. 209, 41, 1915.
 Sherman, N. C. Ext. C. 66, 17, 1918.
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 Talbert, Mo. Ext. C. 15, 6, 1917.
 Tenn. Hort. Soc. Proc. 10, 11, 1915.
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 Werner, N. D. C. 17, 42, 1918.
 White, N. Y. Dept. Agr. B. 102, 102, 1917.
 Wilkinson, C. Gentl. 81, 158, 1919.
 Wilson, Wis. Col. Agr. Ext. C. 78, 7, 1917.
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Spraying apparatus, spray gun

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O'Kane, N. H. Dept. Agr. Bien. R. 1918, 242, 1919.

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Wiggan, Mo. St. Bd. Agr. R. 48, 393, 1916.

Spraying, berries

Beach, Iowa Ext. B. 35, 27, 1915.

Spraying, blackberries

Eustace & Pettit, Mich. Sp. B. 93, 17, 1919.

Spraying, bush fruits

Hesler, New Eng. Homest. 78, 9, 17, 1919.

Kiethly, Wis. Hort. 9, 93, 1919.

Spraying, cabbage

Beach, Iowa Ext. B. 35, 29, 1915.

Spraying cattle, for lice

Imes, U. S. F. B. 909, 9, 1918.

Spraying, cherries

Barss & Lovett, Oreg. Ext. B. 196, 1917.

Beach, Iowa Ext. B. 35, 23, 1915.

Eustace & Pettit, Mich. Sp. B. 93, 14, 1919.

Spraying chemicals

Sherman, N. C. Dept. Agr. B. 209, 39, 1915.

Sherman, N. C. Ext. C. 66, 16, 1918.

Fulton, Fla. St. Hort. Soc. Proc. 30, 60, 1917.

Grossenbacher, Fla. Grower 17, 20, 10, 1918.

McCoy, Orchard & Farm 30, 3, 12, 1918.

Moreno, Fla. Gr. 11, 23, 14, 1915.

Tenny, Fla. Gr. 13, 18, 10, 1916.

Watson, Fla. Gr. 19, 12, 25, 1919.

Yothers, Fla. Gr. 15, 10, 5, 1917.

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Spraying, combination, for insects and diseases

Jones, Wash. Hort. Assoc. R. 12, 123, 1916.

Spraying, community

Geiger, Fla. Hort. Soc. Proc. 32, 122, 1919.

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Spraying, compulsory

Geiger, Fla. Gr. 20, 1, 8, 1919.

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Morris, Am. Nut Jour. 9, 37, 1918.

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Spraying, cooperative

Cookingham, C. Gentl. 83, 16, 34, 1918.

Drake, Penn. Farm. 43, 579, 1918.

Geiger, Fla. Gr. 20, 1, 8, 1919.

Howard, Mo. B. 124, 189, 1915.

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 McPheeters, Minn. Hort. 47, 218, 1919.
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 Conner, Utah B. 165, 1918.
 Crosby, J. Ec. Ent. 9, 375, 1916.
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 Douglass, Rur. N. Y. 76; 324, 376, 1918.
 Engberg, Succ. Farm. 18, 5, 46, 1919.
 Foster, Gem St. Rural 23, 29, 4, 1918.
 Foster, Oreg. Farm. 28, 19, 7, 1918.
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 Weldon, Cal. Hort. B. 8, 238, 1919.
 Wright, Natl. Stockman 40, 1436, 1917.
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 Chambers, Amer. Cran. Gr. Assoc. Proc. Meet. 46, 8, 1916.
- Spraying, cucumber**
 Brehm, C. Gentl. 80, 655, 1915.
 Eustace & Pettit, Mich. Sp. B. 93, 19, 1919.
- Spraying, currant**
 Beach, Iowa Ext. B. 35, 27, 1915.
 Eustace & Pettit, Mich. Sp. B. 93, 16, 1919.
- Spraying, damage from**
 Stewart, Penn. Farm. 39, 30, 1916.
- Spraying, danger from**
 Gossard, Ohio Farm, 554, 1917.
- Stewart, Natl. Stock & Farm. 39, 370, 1915.
 Stewart, Mo. & Kans. Farm. 32, 5, 7, 1916.
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- Spraying, experiments**
 Brittain, Agr. Gaz. Can. 4, 193, 1917.
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 Winslow, Agr. Gaz. Can. 4, 209, 1917.
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 Stack, Farm Engineering 3, 1, 11, 1916.
- Spraying, Gammon system**
 Weldon, Cal. Hort. B. 5, 275, 1916.
 Weldon, Cal. Hort. B. 7, 339, 1918.
- Spraying, garden insects**
 Frank, Wash. Mo. B. 5, 50, 1917.
- Spraying, gooseberries**
 Eustace & Pettit, Mich. Sp. B. 93, 16, 1919.
- Spraying, grape**
 Beach, Iowa Ext. B. 35, 26, 1915.
 Carmody, Ky. Ext. C. 30, 8, 1915.
 Eustace & Pettit, Mich. Sp. B. 93, 15, 1919.
 Hartzell, N. Y. St. Fr. Gr. Assoc. Proc. 14, 127, 1915.

Spraying, grapes (*Cont'd.*)

Hartzell, N. Y. Dept. Agr. B. 79, 1297, 1916.

Rose, Mo. Fruit C. 11, 1918.

Somes, Mo. Fruit C. 9, 1915.

Stuckey, So. Cult. 75, 11, 24, 1917.

Stuckey, So. Cult. 76, 10, 23, 1918.

Spraying, grasshoppers

McCall, Gem St. Rural 22, 2, 1, 1916.

Spraying, Heliothis obsoleta

M'Colloch, Or, Judd Farm. 61, 2, 6, 1916.

Spraying, house plants

Gall, Can. Hort. 38, 34, 1915.

Spraying, irrigation system

Skinner, Fruitm. & Gardn. 18, 7, 8, 1915.

Spraying, melons

Beach, Iowa Ext. B. 28, 1915.

Spraying, Missouri

Howard, Mo. B. 124, 1915.

Spraying, new practice

Talbert, New Eng. Farms 2, 41, 10, 1919.

Spraying, Niagara Co.

Strickland & Peet, N. Y. Dept. Farms & Markets B. 106, 1918.

Spraying, nursery

O'Byrne, Fla. Gr. 20, 20, 8, 1919.

Spraying, oranges

Winberg, Ala. Farm Facts 4, 92, 9, 1919.

Spraying, orchard*

Alderman, Nat. Stock. & Farm. 39, 1275, 1916.

Alderman, W. Va. Ext. C. 172, 1918.

Barss & Lovett, Oreg. B. 228, 1916.

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Bien. R. 15, 63, 1919.

Beach, Iowa Ext. B. 35, 1915.

Blodgett, Iowa Hort. Soc. Tr. 52, 50, 1918.

Bunting, J. Agr. Quebec 18, 207, 1915.

Caesar, Ont. Dept. Agr. B. 250, 3, 1917.

Conradi & Barre, S. C. Ext. C. 17, 1919.

Cooper, Neb. Ext. B. 24, 1914.

Curtiss, Iowa R. 1918, 32.

Dean, Kans. Hort. Soc. Trans. 34, 202, 1918.

Dunlap, Minn. Hort. 44, 119, 1916.

Frank, Wash. Mo. B. 5, 171, 1917.

Garman, Ky. Agr. Labor & Stat. Bien. R. 22, 425, 1918.

Herrick, Iowa Dept. Agr. R. 19, 493, 1919.

Herron, Miss. Ext. C. 19, 1917.

Hoffman et al., S. C. Ext. C. 18, 19, 1919.

Lewis, Kans. B. 203, 1915.

McDowell, Pa. St. Col. Ext. C. 55, 1917.

Perrine, Ill. Hort. Soc. Tr. n. s. 51, 265, 1917.

Rees, Wash. Mo. B. 2, 12, 10, 1915.

Sanders, Me. St. Pomol. Soc. R. 1915, 30, 1916.

Sherman, N. C. Dept. Agr. B. 209, 27, 1915.

Sherman, N. C. R. 38, 20, 1915.

Sherman, N. C. Ext. C. 66, 1918.

Simmons, Minn. Hort. 45, 109, 1917.

Wilson, Wis. Agr. 41, 8, 1, 1917.

Spraying, Ozarks

Radder, C. Gentl. 84, 3, 13, 1919.

Spraying, peach*

Barss & Lovett, Oreg. Ext. B. 195, 1917.

Beach, Iowa Ext. B. 35, 23, 1915.

Chase, Ga. Ent. C. 21, 1917.

Drew, Va. Dept. Agr. B. 109, 101, 1916.

Eustace & Pettit, Mich. Sp. B. 93, 9, 1919.

Farley, Penn. Hort. Assoc. Proc. 57, 22, 1916.

Gillam, N. J. Ext. B. 1, 13, 51, 1917.

Lanham & Hayes, Tex. Ext. B. 29, 26, 1916.

Richards, Ind. Hort. Soc. Tr. 1915, 432, 1916.

Roberts, Peninsula Hort. Soc. Tr. 29, 30, 1916.

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Sherman, N. C. R. 38, 21, 1915.

Watson, Tenn. Ext. Pub. 30, 1917.

Spraying, pear

Barss, Oreg. St. Bd. Hort. Bien. R. 15, 66, 1919.

Barss & Lovett, Oreg. Ext. B. 193, 1917.

Clement & Robb, Ont. Dept. Agr. B. 249, 18, 1917.

Eustace & Pettit, Mich. Sp. B. 93, 12, 1919.

Strickland, Proc. N. Y. Fr. Gr. Assoc. 17, 21, 1918.

Spraying, pipe system

Schroeder, Maritime Farm. 21, 118, 1915.

Starcher, Va. Hort. Soc. R. 20, 208, 1916.

Spraying, plum

- Barss & Lovett, Oreg. Ext. B. 194, 1917.
 Beach, Iowa Ext. B. 35, 25, 1915.
 Eustace & Pettit, Mich. Sp. B. 93, 14, 1919.
 Moore, Wis. Agr. 41, 9, 14, 1917.
 Stuckey, Southern Cult. 76, 4, 36, 1918.

Spraying, poisons used

- Eustace & Pettit, Mich. Sp. B. 93, 26, 1919.

Spraying, potato*

- Arthur, Penn. Farm. 37, 442, 1915.
 Beach, Iowa Ext. B. 35, 28, 1915.
 Carlisle, N. H. Ext. C. 13, 6, 1914.
 Erwin, Proc. Amer. Soc. Hort. Sci. 14, 45, 1917.
 Fox, N. Y. C. Mem. 22, 607, 1919.
 Graham, Minn. Ent. R. 17, 21, 1918.
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 Hume, S. D. B. 176, 752, 1917.
 Kendrick, W. Va. C. 233, 1919.
 Leiby, N. C. Dept. Agr. B. 254, 1919.
 Leiby & Sherman, N. C. Ext. C. 48, 1917.
 Macoun, Can. Dept. Agr. (Hort. Div.) B. 90, 46, 1918.
 Melhus, Iowa Ext. B. 56, 11, 1917.
 Morse, Me. Dept. Agr. B. 17, 1, 33, 1918.
 Ramsey, Me. Ext. B. 119, 1918.
 Rankin, Quebec Soc. Protec. Pl. R. 11, 49, 1919.
 Ruggles & Graham, Minn. Ext. Sp. B. 29, 22, 1918.
 Sherman, N. C. R. 38, 22, 1915.
 Stewart, N. Y. Dept. Agr. B. 57, 1125, 1915.
 Stewart, N. Y. Dept. Agr. B. 102, 79, 1917.
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 Talmadge, Nassau Co. N. Y. Farm Bur. News 5, 4, 2, 1919.
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 Ten Eyck, Emerson-Brantingham Impl. Co. F. B. 5, 47, 1919.
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Spraying, potato, results

- Gage, Mich. Farm. 147, 21, 1916.
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Spraying, prunes

- Barss & Lovett, Oreg. Ext. B. 194, 1917.

Spraying, raspberries

- Eustace & Pettit, Mich. Sp. B. 93, 17, 1919.

Spraying, results

- Beach, Iowa Agr. 15, 292, 1915.
 Becker, Iowa Agr. 16, 210, 1915.
 Bliss, Iowa Hort. Soc. R. 52, 53, 1918.
 Brown, Fruit Belt 12, 10, 4, 1914.
 Brown, Farm & Fireside 38, 13, 14, 1915.
 Burnett, Greene's Fr. Gr. 35, 3, 21, 1915.
 Cameron & Treherne, Can. Dept. Agr. Ent. B. 15, 45, 1918.
 Clark, Iowa Agr. 15, 592, 1915.
 Clinton, Rur. N. Y. 75, 435, 1916.
 Cox, Amer. Agr. 97, 12, 3, 1916.
 Craig, Prairie Farm. 88, 322, 1916.
 Cutler, Iowa Homest. 63, 325, 1918.
 Davis, Wallace's Farm. 41, 1441, 1916.
 Delohery, Succ. Farm. 16, 5, 24, 1917.
 Duncan, Iowa Hort. Soc. R. 52, 57, 1918.
 Edwards, Am. Nut. Jour. 6, 47, 1917.
 Engberg, Succ. Farm. 18, 5, 46, 1919.
 Erwin, Iowa Homest. 60, 510, 1915.
 Gregor, Iowa Hort. Soc. R. 52, 380, 1918.
 Hall, Fruit Belt 11, 7, 1915.
 Harrington, Farmer, St. Paul, 37, 2080, 1919.
 Harris, Can. Hort. 42, 136, 1919.
 Hearst, Ont. Min. Agr. R. f. 1915, 34, 1916.
 Herrick, Iowa Agr. 19, 349, 1918.
 Herrick, Iowa Homest. 64, 221, 1919.
 Holst, Col. Rur. World 68, 10, 10, 1915.
 Hoyle, Farm & Ranch, 37, 48, 10, 1918.
 Kellogg, Wis. Agr. 40, 46, 14, 1916.
 Leiby, N. C. Dept. Agr. 40, 3, 37, 1919.
 Lowther, Gem St. Rural 23, 7, 11, 1917.
 Maheux, Quebec Soc. Protec. Pl. R. 11, 57, 1919.
 Morse, Me. St. Pomol. Soc. R. 1915; 44, 47, 1916.
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 Roberts, Wis. Hort. 8, 25, 1917.
 Sanders, Maritime Farm. 22, 227, 1916.

Spraying, results (Cont'd.)

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 Strickland, Fruit Belt 14, 2, 14, 1918.
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 Talbert, Fruit Belt 15, 2, 6, 1919.
 Talbert, Iowa Homest 64, 220, 1919.
 Tanzberger, Mich. Farm. 151, 9, 1918.
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 Whitten, Mo. Farm. 8, 95, 1916.
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Spraying, results, Nova Scotia

- Sanders, Agr. Gaz. Can. 4, 115, 1917.

Spraying, Rhagoletis pomonella

- West, Vt. St. Hort. Soc. R. 12, 9, 1915.

Spraying, scale insects

- Colon, Porto Rico R. 1917-18, 48, 1919.
 Quayle, Cal. C. 129, 9, 1915.

Spraying, shade trees

- Levison, Am. Forestry 22, 485, 1916.
 Stone, Mass. B. 170, 249, 1916.
 Swaine, Quebec Soc. Protec. Pl. R. 7, 93, 1915.

Spraying, statistics

- Brittain, Nova Scotia Fr. Gr. Assoc. R. 51, 45, 1915.

Spraying, stone fruits

- Barss & Lovett, Oreg. Ext. B. 291, 1918.

Spraying, strawberries

- Beach, Iowa Ext. B. 35, 26, 1915.
 Eustace & Pettit, Mich. Sp. B. 93, 17, 1919.

Spraying, summer

- Crosby & Mix, N. Y. C. B. 356, 129, 1915.
 Meyer, Mo. Ext. Project 12, 41, 1919.
 Swallow, Texas Ext. Ser. Farm. News 4, 27, 3, 1919.

Spraying, tobacco

- Slate, Prog. Farm. 30, 473, 1915.

Spraying, tomato

- Temple, Md. Ext. Circ. L. 42.
 Temple, Md. St. Col. J. 1, 6, 18, 1918.
 Temple, Md. Farm. 1, 34, 1, 1919.

Spraying, truck crops

- Sherbakoff, Fla. Gr. 19, 9, 8, 1919.

Spraying, underground

- Jones, Green's Fr. Gr. 37, 11, 3, 1917.

Spraying, vegetables

- Beach, Iowa Ext. B. 35, 29, 1915.

- Bechtel, Nat. Stock. & Farm. 39, 1274, 1916.

- Graham, Minn. Hort. 47, 408, 1919.

- Moore, Wis. Agr. 41, 18, 14, 1917.

- Reed & Huelson, Purdue Agr. 12, 483, 1918.

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- Rosa, Iowa Farm. No. 2010, 12, 1918.

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- Rosa, Rocky Mt. Husbandm. 43, 36, 5, 1918.

- Stuckey, Southern Cult. 74, 11, 24, 1916.

Spraying vs. dusting

- Farley, Peninsula Hort. Soc. Tr. 31, 33, 1918.

Spraying vs. fumigation

- Braun, Cal. Hort. B. 8, 105, 1919.

Spraying, war time

- Parrott, Proc. N. Y. Fr. Gr. Assoc. 17, 33, 1918.

Spraying, well water and lime

- Yothers, Fla. Gr. 16, 17, 10, 1917.

Spraying, when inadvisable

- Harper, Fla. Gr. 19, 9, 39, 1919.
 O'Kane, C. Gentl. 84, 7, 50, 1919.

Spraying, winter

- Swallow, Texas Ext. Serv. Farm. News 4, 27, 1, 1919.
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Sprays, combination

- Foster, Wash. Hort. Assoc. R. 11, 30, 1915.
 Ruggles, Minn. Hort. 45, 147, 1917.

Sprays, how they kill

- Melander, Wash. Hort. Assoc. R. 11, 35, 1915.

Sprays, liquid

- Soverhill, Ill. Hort. Soc. Tr. 63, 264, 1918.

Sprays, mixing

- Melander & Heald, Wash. Pop. B. 100, 13, 1916.

Sprays, orchard, sweetened

- Wright, Nat. Stock. & Farmer 43, 21, 17, 1919.

Sprays, winter

- Melander, Wash. Pop. B. 107, 1917.

Springtail, see Sminthurus hortensis**Spruce bud moth, see Harmologa fumiferana****Spruce bud scale, see Physokermes piceae****Spruce bud worm, see Harmologa fumiferana**

- Spruce gall aphid**, *see* *Adelges abietis*,
Gillettea cooleyi and *Pineus similis*
- Squash borer**, *see* *Anasa tristis*
- Squash insects**
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- Stauropodoctonus mauritii**
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- Stauropus persimilis**
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- Stegomyia queenslandensis and yellow fever**
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matus longispina
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